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1 [A graphics aided drafting system \(GRAD\)](#)

C. Alaimo

 January 1967 **Proceedings of the 4th conference on Design automation**

 Full text available: [pdf\(4.04 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The standard Bell System schematic drawing package, as the name implies, consists mainly of a series of schematic drawings which describe functionally a circuit or system of circuits being developed. In addition to this pictorial information, the package also provides other information which clarifies the descriptions of the circuits. Among this additional information is: A. The apparatus figures - which are a tabular listing, according to equipment unit, of all of the circuit pa ...

2 [Indexing of network constrained moving objects](#)

Dieter Pfoser, Christian S. Jensen

 November 2003 **Proceedings of the 11th ACM international symposium on Advances in geographic information systems**

 Full text available: [pdf\(574.96 KB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

With the proliferation of mobile computing, the ability to index efficiently the movements of mobile objects becomes important. Objects are typically seen as moving in two-dimensional (x,y) space, which means that their movements across time may be embedded in the three-dimensional (x,y,t) space. Further, the movements are typically represented as trajectories, sequences of connected line segments. In certain cases, movement is restricted, and specifically in this paper, we aim at ...

Keywords: indexing moving objects, indexing network data, moving object databases, spatiotemporal databases

3 [Fast high-level power estimation for control-flow intensive design](#)

Kamal S. Khouri, Ganesh Lakshminarayana, Niraj K. Jha

 August 1998 **Proceedings of the 1998 international symposium on Low power electronics and design**

 Full text available: [pdf\(901.04 KB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we present a power estimation technique for control-flow intensive designs that is tailored towards driving iterative high-level synthesis systems, where hundreds of

architectural trade-offs are explored and compared. Our method is fast and relatively accurate. The algorithm utilizes the behavioral information to extract branch probabilities, and uses these in conjunction with switching activity and circuit capacitance information, to estimate the power consumption of a given ...

4 Stream synthesis for efficient power simulation based on spectral transforms

Alberto Macii, Enrico Macii, Massimo Poncino, Riccardo Scarsi

August 1998 **Proceedings of the 1998 international symposium on Low power electronics and design**


Full text available:  [pdf\(750.84 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we present a power estimation technique for control-flow intensive designs that is tailored towards driving iterative high-level synthesis systems, where hundreds of architectural trade-offs are explored and compared. Our method is fast and relatively accurate. The algorithm utilizes the behavioral information to extract branch probabilities, and uses these in conjunction with switching activity and circuit capacitance information, to estimate the power consumption of a given ...

5 Dimensionality reduction for similarity searching in dynamic databases

K. V. Ravi Kanth, Divyakant Agrawal, Ambuj Singh

June 1998 **ACM SIGMOD Record , Proceedings of the 1998 ACM SIGMOD international conference on Management of data**, Volume 27 Issue 2

Full text available:  [pdf\(1.38 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Databases are increasingly being used to store multi-media objects such as maps, images, audio and video. Storage and retrieval of these objects is accomplished using multi-dimensional index structures such as R*-trees and SS-trees. As dimensionality increases, query performance in these index structures degrades. This phenomenon, generally referred to as the dimensionality curse, can be circumvented by reducing the dimensionality of the data. Such a reduction is however accompanied by a lo ...

6 Efficient algorithms for block-cyclic array redistribution between processor sets

Neungsoo Park, Viktor K. Prasanna, Cauligi Raghavendra

November 1998 **Proceedings of the 1998 ACM/IEEE conference on Supercomputing (CDROM)**


Full text available:  [pdf\(218.26 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Run-time array redistribution is necessary to enhance the performance of parallel programs on distributed memory supercomputers. In this paper, we present an efficient algorithm for array redistribution from *cyclic(x)* on *P* processors to *cyclic(Kx)* on *Q* processors. The algorithm reduces the overall time for communication by considering the data transfer, communication schedule, and index computation costs. The proposed algorithm is based on a generalized ...

7 A vector space model for automatic indexing

G. Salton, A. Wong, C. S. Yang

November 1975 **Communications of the ACM**, Volume 18 Issue 11

Full text available:  [pdf\(687.42 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In a document retrieval, or other pattern matching environment where stored entities (documents) are compared with each other or with incoming patterns (search requests), it appears that the best indexing (property) space is one where each entity lies as far away from the others as possible; in these circumstances the value of an indexing system may be expressible as a function of the density of the object space; in particular, retrieval performance may correlate inversely with space densit ...

Keywords: automatic indexing, automatic information retrieval, content analysis, document space


- 8 Posters: HAT: a hardware assisted TOP-DOC inverted index component
S. Kagan Agun, Ophir Frieder
July 2003 **Proceedings of the 26th annual international ACM SIGIR conference on Research and development in informaion retrieval**

Full text available:  [pdf\(158.87 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A novel Hardware Assisted Top-Doc (HAT) component is disclosed. HAT is an optimized content indexing device based on a modified inverted index structure. HAT accommodates patterns of different lengths and supports a varied posting list versus term count feature sustaining high reusability and efficiency. The developed component can be used either as an internal slave component or as an external co-processor and is efficient in resource demands as the component controllers take only a minimal per ...

Keywords: hardware support, inverted index file

- 9 Efficient Algorithms for Block-Cyclic Array Redistribution between Processor Sets
Neungsoo Park, Viktor K. Prasanna, Cauligi Raghavendra
November 1998 **Proceedings of the Proceedings of the IEEE/ACM SC98 Conference**

Full text available:  [Publisher Site](#) Additional Information: [full citation](#), [abstract](#)


Run-time array redistribution is necessary to enhance the performance of parallel programs on distributedmemory supercomputers. In this paper, we present an efficient algorithm for array redistribution from cyclic(x) on P processors to cyclic(Kx) on Q processors. The algorithm reduces the overall time for communication by considering the data transfer, communication schedule, and index computation costs. The proposed algorithm is based on a generalized circulant matrix formalism. Our algorithm gene ...

- 10 An index organization for applications with highly skewed access patterns
Christer Hultén
March 1981 **Proceedings of the 5th international conference on Software engineering**

Full text available:  [pdf\(556.47 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The conventional way of organizing indices in large data base systems is to use balanced tree structures such as B-trees or static tree structures, e.g. ISAM. It is well known in practice that most applications do not have a uniform record reference distribution but rather the 80/20-rule or Zipf's law applies. The balanced index implementations mentioned do not exploit these skewed access patterns. This paper, which is an extract from the author's Ph.D.-thesis, proposes a data st ...

- 11 Optimization: Transistor sizing of energy-delay-efficient circuits
Paul I. Péntzes, Mika Nyström, Alain J. Martin
December 2002 **Proceedings of the 8th ACM/IEEE international workshop on Timing issues in the specification and synthesis of digital systems**

Full text available:  [pdf\(207.24 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


This paper studies the problem of transistor sizing of CMOS circuits optimized for energy-delay efficiency, i.e., for optimal Et^n where E is the energy consumption and t is the delay of the circuit, while n is a fixed positive optimization index that reflects the chosen trade-off between energy and delay. We propose a set of analytical formulas that closely approximate the optimal transistor sizes. We then study an efficient iteration procedure that can furt ...

Keywords: energy-delay optimization, transistor sizing

12 Strip trees: a hierarchical representation for curves

Dana H. Ballard

May 1981 **Communications of the ACM**, Volume 24 Issue 5

Full text available:  [pdf\(1.02 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The use of curves to represent two-dimensional structures is an important part of many scientific investigations. For example, geographers use curves extensively to represent map features such as contour lines, roads, and rivers. Circuit layout designers use curves to specify the wiring between circuits. Because of the very large amount of data involved and the need to perform operations on this data efficiently, the representation of such curves is a crucial issue. A hierarchical represent ...

Keywords: boundary line representation, cartography, computer graphics, computer-searchable structures, contour representation, geographic information processing, graphic data retrieval, intersection of curves, line-drawing processing, points in polygons, polygons, regional boundary representation, spatial information

13 Object oriented spatial positioning systems

István Kádár, Erik Papp

July 1998 **ACM SIGAPL APL Quote Quad , Proceedings of the APL98 conference on Array processing language**, Volume 29 Issue 3

Full text available:  [pdf\(954.50 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The domains of a structured spatial positioning systems are extended to a single 2D or 3D boundary rectangle (MBR - Minimal axes-parallel Boundary Rectangle) domain. We try to encapsulate the domains strictly for the inside and/or the boundary (surface) of the object during our attempts. In ease of such domains it is impossible to use traditional coordinates because of boundary irregularity. Therefore we applied 2D and 3D versions of subrange type data structure for spatial indexing, which are w ...

14 Modeling methodology a: Hybrid dynamic systems: mode transition behavior in hybrid dynamic systems

Pieter J. Mosterman

December 2003 **Proceedings of the 35th conference on Winter simulation: driving innovation**

Full text available:  [pdf\(357.36 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

Physical system modeling benefits from the use of implicit equations because it is often an intuitive way to describe physical constraints and behaviors. To achieve efficient models, model abstraction may lead to idealized component behavior that switches between modes of operation (e.g., an electrical diode may be on or off) based on inequalities (e.g., voltage > 0). In an explicit representation, the combination of these local mode switches leads to a combinatorial explosion of the numbe ...

15 Exploring computer science perspectives: Extending interpreted systems with some deontic concepts

Alessio Lomuscio, Marek Sergot

July 2001 **Proceedings of the 8th conference on Theoretical aspects of rationality and knowledge**

Full text available:  [pdf\(853.79 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

We investigate an extension of interpreted systems to model correct functioning behaviour of agents and of the system as a whole. We combine this notion with the standard epistemic notions defined on interpreted systems to provide a formalism to reason about knowledge that agents are permitted to hold under ideal functioning circumstances. We then extend this by introducing a doubly-indexed operator representing knowledge that an agent would have if it were operating under the assumption that ...

16 Session 2: Propagating epistemic coordination through mutual defaults I

Richmond H. Thomason

March 1990 **Proceedings of the 3rd conference on Theoretical aspects of reasoning about knowledge**

Full text available:  pdf(759.55 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

A *mutual default* is a rule, capable of tolerating exceptions, that is mutually supposed by a group G : i.e., the rule is supposed by all members of the group, is supposed by all members of the group to be supposed by all members of the group, etc. A family of propositional attitudes $B_{\langle i \rangle}$ indexed for $i \in G$ (and representing, say, supposition) is *coordinated* for G if $B_{\langle i \rangle}$ applies to the same propositions for all members i of G , ...

17 Similarity Search: Efficient processing of conical queries

Hakan Ferhatosmanoglu, Divyakant Agrawal, Amr El Abbadi

October 2001 **Proceedings of the tenth international conference on Information and knowledge management**

Full text available:  pdf(1.50 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Conical queries are a novel type of query with an increasing number of applications. Traditional index structures and retrieval mechanisms, in general, have been optimized for rectangular and circular queries, rather than conical queries. In this paper, we focus on conical queries which can be defined as a multi-dimensional cone in a multi-dimensional data space. We develop a model for expressing such queries and suggest efficient techniques for evaluating them. In particular, we explore the ret ...

18 Integrating stress and intonation into a concept-to-speech system

Georg Dorffner, Ernst Buchberger, Markus Kommenda

August 1990 **Proceedings of the 13th conference on Computational linguistics - Volume 2**


Full text available:  pdf(496.10 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

The paper deals with the integration of intonation algorithms into a concept-to-speech system for German. The algorithm for computing the stress hierarchy of a sentence introduced by Kiparski (1973) and the theory of syntactic grouping for intonation patterns developed by Bierwisch (1973) have been studied extensively, but they have never been implemented in a concept-to-speech system like the one presented here. We describe the back end of this concept-to-speech system: The surface generator tr ...

19 XIRQL: An XML query language based on information retrieval concepts

Norbert Fuhr, Kai Großjohann

April 2004 **ACM Transactions on Information Systems (TOIS)**, Volume 22 Issue 2

Full text available:  pdf(231.91 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

XIRQL ("circle") is an XML query language that incorporates imprecision and vagueness for both structural and content-oriented query conditions. The corresponding uncertainty is handled by a consistent probabilistic model. The core features of XIRQL are (1) document ranking based on index term weighting, (2) specificity-oriented search for retrieving the most relevant parts of documents, (3) datatypes with vague predicates for dealing with

specific types of content and (4) structural vagueness f ...


Keywords: Path algebra, XML, XQuery, probabilistic retrieval, ranked retrieval, vague predicates

20 Denormalization and cross referencing in theoretical lexicography

Joseph E. Grimes

July 1984

Full text available:  pdf (337.81 KB)

 Publisher Site

Additional Information: [full citation](#), [abstract](#), [references](#)

A computational vehicle for lexicography was designed to keep to the constraints of meaning-text theory: sets of lexical correlates, limits on the form of definitions, and argument relations similar to lexical-functional grammar. Relational data bases look like a natural framework for this. But linguists operate with a non-normalized view. Mappings between semantic actants and grammatical relations do not fit actant fields uniquely. Lexical correlates and examples are polyvalent, hence denormaliz ...

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1 [Status report of the graphic standards planning committee](#)

Computer Graphics staff

 August 1979 **ACM SIGGRAPH Computer Graphics**, Volume 13 Issue 3

 Full text available: [pdf\(15.01 MB\)](#)

 Additional Information: [full citation](#), [references](#), [citations](#)

2 [Design and verification of the Rollback Chip using HOP: a case study of formal methods applied to hardware design](#)

Ganesh Gopalakrishnan, Richard Fujimoto

 May 1993 **ACM Transactions on Computer Systems (TOCS)**, Volume 11 Issue 2

 Full text available: [pdf\(2.52 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The use of formal methods in hardware design improves the quality of designs in many ways: it promotes better understanding of the design; it permits systematic design refinement through the discovery of invariants; and it allows design verification (informal or formal). In this paper we illustrate the use of formal methods in the design of a custom hardware system called the "Rollback Chip" (RBC), conducted using a simple hardware design description language called "HOP&r ...

3 [Supporting the restructuring of data abstractions through manipulation of a program visualization](#)

Robert W. Bowdidge, William G. Griswold

 April 1998 **ACM Transactions on Software Engineering and Methodology (TOSEM)**, Volume 7 Issue 2

 Full text available: [pdf\(1.57 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

With a meaning-preserving restructuring tool, a software engineer can change a program's structure to ease future modifications. However, deciding how to restructure the program requires a global understanding of the program's structure, which cannot be derived easily by directly inspecting the source code. We describe a manipulable program visualization—the star diagram—that supports the restructuring task of encapsulating a global data structure. The star diag ...

Keywords: meaning-preserving restructuring, semi-automated restructuring, software visualization, star diagram, tool-supported restructuring

4 Automatic tiling of iterative stencil loops

Zhiyuan Li, Yonghong Song

November 2004 **ACM Transactions on Programming Languages and Systems (TOPLAS)**,
Volume 26 Issue 6

Full text available:  pdf(947.69 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


Iterative stencil loops are used in scientific programs to implement relaxation methods for numerical simulation and signal processing. Such loops iteratively modify the same array elements over different time steps, which presents opportunities for the compiler to improve the temporal data locality through loop tiling. This article presents a compiler framework for automatic tiling of iterative stencil loops, with the objective of improving the cache performance. The article first presents a ...

Keywords: Caches, loop transformations, optimizing compilers

5 Supercomputer languages

R. H. Perrott, A. Zarea-Aliabadi

March 1986 **ACM Computing Surveys (CSUR)**, Volume 18 Issue 1


Full text available:  pdf(1.55 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#),
[review](#)

The high-level languages proposed for supercomputers, such as vector and array processors, have been designed using one of the following two approaches: (1) an existing sequential language is adapted, (2) a new language based on the hardware is developed. Recently, there has emerged a third approach, which does not require the programmer to be aware of the sequential nature of the language or the hardware characteristics. Examples of these language groups are examined to illustrate ...

6 Probing the black box: Transforming policies into mechanisms with infokernel

Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, Nathan C. Burnett, Timothy E. Denehy, Thomas J. Engle, Haryadi S. Gunawi, James A. Nugent, Florentina I. Popovici

October 2003 **Proceedings of the nineteenth ACM symposium on Operating systems principles**

Full text available:  pdf(365.12 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We describe an evolutionary path that allows operating systems to be used in a more flexible and appropriate manner by higher-level services. An infokernel exposes key pieces of information about its algorithms and internal state; thus, its default policies become mechanisms, which can be controlled from user-level. We have implemented two prototype infokernels based on the linuxtwofour and netbsdver kernels, called infolinux and infobsd, respectively. The infokernels export key abstractions as ...

Keywords: information, mechanism, policy

7 Description logics for semantic query optimization in object-oriented database systems

Domenico Beneventano, Sonia Bergamaschi, Claudio Sartori

March 2003 **ACM Transactions on Database Systems (TODS)**, Volume 28 Issue 1

Full text available:  pdf(406.56 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Semantic query optimization uses semantic knowledge (i.e., integrity constraints) to transform a query into an equivalent one that may be answered more efficiently. This article proposes a general method for semantic query optimization in the framework of

Object-Oriented Database Systems. The method is effective for a large class of queries, including conjunctive recursive queries expressed with regular path expressions and is based on three ingredients. The first is a Description Logic, ODL

Keywords: Semantic query optimization, description logics, integrity constraints rules, query rewriting method, semantic expansion of a query, subsumption

8 The intrinsic problems of structural heterogeneity and an approach to their solution

Theo Härder, Günter Sauter, Joachim Thomas

April 1999 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 8 Issue 1

Full text available:  pdf(132.99 KB) Additional Information: [full citation](#), [abstract](#), [index terms](#)


This paper focuses on the problems that arise when integrating data from heterogeneous sources in a single, unified database view. At first, we give a detailed analysis of the kinds of structural heterogeneity that occur when unified views are derived from different database systems. We present the results in a multiple tier architecture which distinguishes different levels of heterogeneity and relates them to their underlying causes as well as to the mapping conflicts resulting from the view de ...

Keywords: Heterogeneity, Legacy systems, Mapping language, Schema integration, Schema mapping, Updatable views

9 Technical papers: concurrency: Assuring and evolving concurrent programs: annotations and policy

Aaron Greenhouse, William L. Scherlis

May 2002 **Proceedings of the 24th International Conference on Software Engineering**


Full text available:  pdf(1.38 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Assuring and evolving concurrent programs requires understanding the concurrency-related design decisions used in their implementation. In Java-style shared-memory programs, these decisions include which state is shared, how access to it is regulated, the roles of threads, and the policy that distinguishes desired concurrency from race conditions. These decisions rarely have purely local manifestations in code. In this paper, we use case studies from production Java code to explore the costs and ...

10 The state of the art in locally distributed Web-server systems

Valeria Cardellini, Emiliano Casalicchio, Michele Colajanni, Philip S. Yu

June 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 2

Full text available:  pdf(1.41 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The overall increase in traffic on the World Wide Web is augmenting user-perceived response times from popular Web sites, especially in conjunction with special events. System platforms that do not replicate information content cannot provide the needed scalability to handle large traffic volumes and to match rapid and dramatic changes in the number of clients. The need to improve the performance of Web-based services has produced a variety of novel content delivery architectures. This article w ...

Keywords: Client/server, World Wide Web, cluster-based architectures, dispatching algorithms, distributed systems, load balancing, routing mechanisms

11 Processing XML streams with deterministic automata and stream indexes

Todd J. Green, Ashish Gupta, Gerome Miklau, Makoto Onizuka, Dan Suciu

December 2004 **ACM Transactions on Database Systems (TODS)**, Volume 29 Issue 4

Full text available:  pdf(717.00 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


We consider the problem of evaluating a large number of XPath expressions on a stream of XML packets. We contribute two novel techniques. The first is to use a single Deterministic Finite Automaton (DFA). The contribution here is to show that the DFA can be used effectively for this problem: in our experiments we achieve a constant throughput, independently of the number of XPath expressions. The major issue is the size of the DFA, which, in theory, can be exponential in the number of XPath expr ...

Keywords: XML processing, stream processing

12 [Texture mapping 3D models of real-world scenes](#)

Frederick M. Weinhaus, Venkat Devarajan

December 1997 **ACM Computing Surveys (CSUR)**, Volume 29 Issue 4

Full text available:  pdf(1.98 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)


Texture mapping has become a popular tool in the computer graphics industry in the last few years because it is an easy way to achieve a high degree of realism in computer-generated imagery with very little effort. Over the last decade, texture-mapping techniques have advanced to the point where it is possible to generate real-time perspective simulations of real-world areas by texture mapping every object surface with texture from photographic images of these real-world areas. The technique ...

Keywords: anti-aliasing, height field, homogeneous coordinates, image perspective transformation, image warping, multiresolution data, perspective projection, polygons, ray tracing, real-time scene generation, rectification, registration, texture mapping, visual simulators, voxels

13 [Packrat parsing: simple, powerful, lazy, linear time, functional pearl](#)

Bryan Ford

September 2002 **ACM SIGPLAN Notices , Proceedings of the seventh ACM SIGPLAN international conference on Functional programming**, Volume 37 Issue 9

Full text available:  pdf(171.57 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Packrat parsing is a novel technique for implementing parsers in a lazy functional programming language. A packrat parser provides the power and flexibility of top-down parsing with backtracking and unlimited lookahead, but nevertheless guarantees linear parse time. Any language defined by an LL(k) or LR(k) grammar can be recognized by a packrat parser, in addition to many languages that conventional linear-time algorithms do not support. This additional power simplifies the handling ...

Keywords: Haskell, backtracking, lexical analysis, memoization, parser combinators, scannerless parsing, top-down parsing

14 [Session P9: view-dependent visualization: Fast view-dependent level-of-detail rendering using cached geometry](#)

Joshua Levenberg

October 2002 **Proceedings of the conference on Visualization '02**

Full text available:  pdf(358.85 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Level-of-detail rendering is essential for rendering very large, detailed worlds in real-time. Unfortunately, level-of-detail computations can be expensive, creating a bottleneck at the CPU. This paper presents the CABTT algorithm, an extension to existing binary-triangle-tree-based level-of-detail algorithms. Instead of manipulating triangles, the CABTT algorithm instead operates on clusters of geometry called aggregate triangles. This reduces CPU overhead, eliminating a bottleneck common to lev ...

Keywords: binary triangle trees, displacement maps, frame-to-frame coherence, height fields, level of detail, multiresolution meshes, terrain, triangle bintree, view-dependent mesh

15 Data-Driven and Demand-Driven Computer Architecture

Philip C. Treleaven, David R. Brownbridge, Richard P. Hopkins

January 1982 **ACM Computing Surveys (CSUR)**, Volume 14 Issue 1

Full text available:  pdf(4.14 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

16 Weasel: a computer based system for providing non-visual access to music notation

B. P. Challis, A. D. N. Edwards

January 2000 **ACM SIGCAPH Computers and the Physically Handicapped**, Issue 66


Full text available:  pdf(877.59 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

Although we constantly rely on touch and sound on a daily basis, product designers rarely monopolise the potential for auditory and, in particular, tactile feedback. This is particularly true within computer interface design where there is still a trend to work with highly graphical interfaces using only a mouse and a keyboard for input. This kind of kind of reliance on visual interaction actively prevents blind people from using many common computer applications. At the University of York we ha ...

17 Cache miss equations: a compiler framework for analyzing and tuning memory behavior

Somnath Ghosh, Margaret Martonosi, Sharad Malik

July 1999 **ACM Transactions on Programming Languages and Systems (TOPLAS)**, Volume 21 Issue 4

Full text available:  pdf(548.18 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


With the ever-widening performance gap between processors and main memory, cache memory, which is used to bridge this gap, is becoming more and more significant. Caches work well for programs that exhibit sufficient locality. Other programs, however, have reference patterns that fail to exploit the cache, thereby suffering heavily from high memory latency. In order to get high cache efficiency and achieve good program performance, efficient memory accessing behavior is necessary. In fact, f ...

Keywords: cache memories, compilation, optimization, program transformation

18 Linear analysis and optimization of stream programs

Andrew A. Lamb, William Thies, Saman Amarasinghe

May 2003 **ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 2003 conference on Programming language design and implementation**, Volume 38 Issue 5

Full text available:  pdf(489.80 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

As more complex DSP algorithms are realized in practice, there is an increasing need for

high-level stream abstractions that can be compiled without sacrificing efficiency. Toward this end, we present a set of aggressive optimizations that target linear sections of a stream program. Our input language is StreamIt, which represents programs as a hierarchical graph of autonomous filters. A filter is linear if each of its outputs can be represented as an affine combination of its inputs. Linearity ...

Keywords: DSP, FFT, StreamIt, algebraic simplification, embedded, linear systems, optimization, stream programming

19 [Efficient logic variables for distributed computing](#)

Seif Haridi, Peter Van Roy, Per Brand, Michael Mehl, Ralf Scheidhauer, Gert Smolka

May 1999 **ACM Transactions on Programming Languages and Systems (TOPLAS)**,

Volume 21 Issue 3

Full text available:  [pdf\(572.35 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We define a practical algorithm for distributed rational tree unification and prove its correctness in both the off-line and on-line cases. We derive the distributed algorithm from a centralized one, showing clearly the trade-offs between local and distributed execution. The algorithm is used to realize logic variables in the Mozart Programming System, which implements the Oz language (see <http://www/mozart-oz.org>). Oz appears to the programmer as a concurrent object-oriented language with ...


Keywords: Mozart, Oz, distributed algorithms

20 [Automated assistance for program restructuring](#)

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Maintenance tends to degrade the structure of software, ultimately making maintenance more costly. At times, then, it is worthwhile to manipulate the structure of a system to make changes easier. However, manual restructuring is an error-prone and expensive activity. By separating structural manipulations from other maintenance activities, the semantics of a system can be held constant by a tool, assuring that no errors are introduced by restructuring. To allow the maintenance team to focus ...

Keywords: CASE, flow analysis, meaning-preserving transformations, software engineering, software evolution, software maintenance, software restructuring, source-level restructuring

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